Lake Wissota Bridge
(Silver Bridge)
Spanning Lake Wissota at County Trunk Highway "S"
Vicinity of Chippewa Falls
Chippewa County
Wisconsin

HAER No. WI-12

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

Historic American Engineering Record
National Park Service
Department of the Interior
Denver, Colorado 80225-0287

HISTORIC AMERICAN ENGINEERING RECORD
LAKE WISSOTA BRIDGE
(Silver Bridge)
VICINITY OF CHIPPEWA FALLS
HAER NO. WI-12

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Location:	Spanning Lake Wissota at County Trunk Highway "S" in the vicinity of Chippewa Falls, Chippewa County, Wisconsin.
UTM:	A (south end): 15:4981435:630415 B (north end): 15:4981655:630435
Quad:	Lake Wissota, Wisconsin.
Date of Construction:	1908
Fabricator:	Toledo Bridge and Crane Company, Toledo, Ohio.
Present Owner:	None
Present Use:	Demolished and replaced by Bridge No. B-09-0116) in 1986.
Significance:	The four-span Lake Wissota Bridge, built in 1916, was the oldest of the seventeen Parker overhead trusses with riveted connections and built-up members identified in a 1982 survey. Of these Parker trusses, the Lake Wissota Bridge was the only one with roller-nest expansion bearings.
Project Information:	The Lake Wissota Bridge was documented by Robert S. Newbery, Historian for the Wisconsin Department of Transportation, in accordance with the Memorandum of Agreement as a mitigative measure prior to the demolition of the bridge. Amy A. Ross, Mead & Hunt, Inc., assisted in the documentation.

HISTORICAL BACKGROUND

Chippewa County, established in 1845, was one of the original 29 counties that composed Wisconsin when the state was admitted to the Union in 1848. At that time, the county encompassed much of north-central Wisconsin. A series of boundary changes, enacted by 1854, reduced Chippewa County to a relatively stable form. However, throughout the remainder of the nineteenth century, portions of the county were detached and annexed to neighboring counties and three counties were created from parts of northern Chippewa County. In 1901, Chippewa County achieved its final form.[1]

The town of Chippewa Falls was originally settled in the late 1830s, and the first elections were held in 1857. An act of the legislature in 1869 made Chippewa Falls a city, with a population of about 2,000. In the late nineteenth century, Chippewa Falls was an important midpoint in the transport of logs and roughcut lumber from the northern woods downstream to the Mississippi River. This community was soon surpassed in size and output by the city of Eau Claire, located some dozen miles to the southwest and originally settled in 1845.

Chippewa Falls was founded on the banks of the Chippewa River, 63 miles upstream from its junction with the Mississippi River at Lake Pepin. In 1836, construction of a sawmill at Chippewa Falls began, built by H.L. Dousman and Jean Brunet. Until 1860, the rich supply of timber in Chippewa County was largely unknown, even to those within the state. As the nineteenth century progressed, Chippewa Falls gained importance as a lumbering center. The Chippewa River Valley, containing one-sixth of the nation's timber west of the Appalachians, quickly became Wisconsin's most important and productive logging region. In 1870, a Chippewa Falls mill sent a raft to St. Louis that carried 2.5 million board feet of timber, or enough to build 125 houses. After the timber reserves were exhausted, the city continued to be important to other industries. The mill at Chippewa Falls cut its last log in 1911, and was replaced by a hydroelectric plant which now occupies the mill site.

When farmers populated the cutover lands, Chippewa Falls became a regional agricultural market center. Chippewa County is one of the richest dairy districts in northwestern Wisconsin. The larger community of Eau Claire maintained the dominant position in commercial activity that it achieved in the lumber era. The industry of Eau Claire had diversified well before the end of the lumbering era,

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[1] In 1901, Rusk County was the last to be formed from a part of the original Chippewa County; see Origins and Legislative History of County Boundaries in Wisconsin (Madison, Wisc.: Wisconsin Historic Records Survey, 1942) 48-55.

with trade in rubber, paper, packaging and canned goods. In the twentieth century, industry in Chippewa Falls developed around its hydroelectric plant, and manufacturing companies. Primary manufacturing industries in the city are now woolens and shoes.[2]

Prior to its demolition in 1986, the Lake Wissota Bridge was located about four miles northeast of the center of the city of Chippewa Falls. Because the river makes a loop to the southeast just outside of town, it is approximately 12 miles by water from downtown to the site of the bridge. The crossing of the Chippewa River at this point was an important link between the city of Chippewa Falls and the rural townships to the northeast. The Chippewa River on the west and south, the Yellow River on the east and south, and Paint Creek on the south, isolated this roughly rectangular area of land, and formed major obstacles to road travel into and out of the area.[3]

As late as 1873, there does not appear to have been a bridge over the Chippewa River within a dozen or more miles upstream of Chippewa Falls, although a number of logging dams are evident. These dams may have allowed for limited crossing of the Chippewa. In the Historical Atlas of Wisconsin (1878), a bridge was indicated in the northeast quarter of Section 26. In 1880, a bridge was shown connecting the northeast quarter of Section 27 with the southwest quarter of Section 23, or about a mile upstream from the other bridge. This latter location, which is northeast of the city of Chippewa Falls, became the site for the Lake Wissota Bridge.[4]

In 1897, complaints about the condition of this first bridge at this location led the County Board of Supervisors to hire an "expert bridge builder" to examine the structure and make recommendations. The expert concluded that repairs were necessary, and plans and specifications were drawn up. The County had hoped to spend only $1500, but the lowest bid, by W.S. Hewitt of Minneapolis, was for $2974. Minor repairs were done in 1901, 1902, and 1903, but proved inadequate. In 1908, a new two-span, 486-foot long steel truss bridge replaced the deteriorated bridge.[5] The north pier of the 1908 structure had to be reconstructed in 1913 at a cost of approximately $3,000.

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[2] Robert C. Nesbit, Wisconsin: A History (Madison, 1973) 302,342; Richard C. Current, The History of Wisconsin, Vol. II, The Civil War Era, 1848-1873 (Madison, 1976) 464-71; see also, Margaret Walsh, The Manufacturing Frontier, Pioneer Industry in Antebellum Wisconsin, 1830-1860 (Madison, 1972) 32-33, 125-140; John B. Gregory, ed. West Central Wisconsin: A History, Volume II (Indianapolis: S.J. Clarke Publishing Co., Inc., 1933) 542, 629, 749, 759-60, 771-86.

[3] See maps: O.R. Dahl, Map of Chippewa County, 1873; Snyder and Van Vechten, Historical Atlas of Wisconsin, 1878; O.R. Dahl, Map of Chippewa County, 1880; C.M. Foote, Platbook of Chippewa County, 1888; J.A. Fullmer and W.T. Rooney, Map of Chippewa County, 1902; Wisconsin Department of Transportation, Map of Chippewa County, January 1981.

[4] Ibid. It is possible that the 1878 map did not accurately locate the bridge.

[5] Proceedings, November 1897, 54; November 1898, 33, 43, 56; March 1899, 22-3; May 1899, 26, 33; November 1899, 48-9; July 1901, 17; August 1902, 51; June 1903, 29; November 1907, 33; March 1908, 17-8; see also November 1904, 7, 25.

Local residents of the area called these early crossings the "Yellow River Bridge," presumably because the Yellow River flows into the Chippewa River near here. In order to clearly identify the bridge, officials were obliged to refer to it as a "certain bridge over the Chippewa River commonly called and known as the Yellow River Bridge" or as "the bridge wbich spans the Chippewa River between the towns of Eagle Point and Anson and known as the Yellow River Bridge." The name "Yellow River Bridge" was used to refer to the Lake Wissota Bridge in 1916 as it was being built but is no longer common. According to a newspaper correspondent, the local name for the Lake Wissota Bridge in recent years was the "Silver Bridge."[6]

Describing the sequence of bridges at this location is complicated for two reasons: first, earlier bridges had a different name; and, second, the Lake Wissota Bridge, built in 1916, provided a crossing not only for the Chippewa River, as had the earlier bridges, but also for the newly created Lake Wissota. Creating the lake necessitated both a new bridge and a shift in the area road network. Thus, while the 1916 Lake Wissota Bridge served the same function as at least three earlier bridges located in the vicinity, it did so with a new name, and in a transformed setting.

The need for a new bridge arose in 1915, not for the usual reason that the existing bridge had deteriorated, but, because, a lake was planned at this site.[7] Wisconsin-Minnesota Light and Power Company (WMLPC) proposed to build a new hydroelectric dam three-and-a-balf miles downstream from the bridge. This new dam would create a lake (WMLPC called it a "pond") which would inundate the existing bridge as well as most of the land for a mile on either side of it. Therefore, the company proposed to relocate the road and the bridge.[8]

This relocation was the subject of considerable controversy as the County Board decided what position to take on WMLPC's proposal. Early on, the board appeared to favor the project, stating that "it is the desire of this Board to encourage the proposed improvement of said river in so far as it can be done without injury to Cbippewa County." As negotiations proceeded however, the board demanded a number of concessions from WMLPC. The final agreement stated that the required change in the bighway transportation system for the dam project was being made "solely for the benefit" of WMLPC, and that, therefore, the County Board was "willing to make sucb change only

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[6] Chippewa County Board of Supervisors. Proceedings, November 1897, 54; Proceedings, November, 1907, 33. (Hereafter, the county board proceedings are cited as simply "Proceedings" with a date and page numbers). Telephone conversation with Charlene Olson, reporter for the Chippewa Herald-Telegram, 1985.

[7] Proceedings, May 1913, 71-2.

[8] A special meeting of the Board of Supervisors was held to discuss WMLPC's proposal. Proceedings, October 1915, 7-10.

on condition that the additional outlay for the construction and maintenance of said new highway and bridge shall be borne by said corporation and its successors in title to, and ownership of said dam and pond."[9]

The WMLPC initially proposed to run the new road north-south along the section line between Sections 27 and 28 and Sections 21 and 22, and to move the existing bridge to that crossing.[10] Some objection to this route was apparently voiced, as the company changed the proposal to a road and bridge on a more easterly alignment. This alignment appears to have met the approval of the Special Committee appointed by the County Board to oversee this project.[11]

In addition to shifting the road easterly, the WMLPC also proposed to build a new bridge, which would be the same length as the old, or about 480 feet. The new bridge would, however, be about four feet wider. The County Board required that the design and construction of the new bridge be acceptable to the Special Committee and the State Highway Commission (SHC). WMLPC offered to pay for the bridge, the necessary right of way, and embankment work—including maintenance "for all time" of that part of the embankment "as shall lie within the pond." The county was to maintain the bridge and road. An important concession by the company in this proposal was the promise that it would "complete the new bridge and approaches at least six weeks before the water is raised to the top of the piers on which the old bridge rests to enable the county to remove the old bridge without any interruption in travel." Although this stipulation was a part of the final agreement, it appears that a severe winter prevented successful completion of the new bridge in time, much to the consternation of local newspaper editors.[12]

Before this proposal could be finalized, WMLPC decided on a different location for the new bridge where a longer structure would be required. The company told the County Board that it had decided that it was "advisable to locate the new bridge at a point where a bridge seven hundred and fifty [feet] in length will be required." The proposed bridge was to be four spans, 20' wide, and have a wood block floor. The county was obviously not happy with the prospect of maintaining a bridge half-again as long as the existing one, and the company, acknowledging "this unexpected change in the situation," proposed to pay 36 per cent of all future "maintenance, repairs or rebuilding." This offer was accepted.[13]

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[9] Proceedings, October 1915, 8; May 1916, 27.

[10] Proceedings, November 1915, 11-12.

[11] Proceedings, October 1915, 77-78.

[12] Proceedings, November 1915, 11-12; Proceedings, May 1916, 35; Chippewa Weekly Herald 26 January 1917: 1, col. 3. Disruption of traffic due to slow completion of the rehabilitation work on the Paint Creek Bridge caused an even bigger problem. Chippewa Weekly Herald 5 January 1917: 1, col. 2.

[13] Proceedings, December 1915, 80-1; May 1916, 29-36.

ENGINEERING DESCRIPTION

The four-span bridge built by WMLPC to cross Lake Wissota (Bridge No. P-09-082) was a riveted Parker overhead truss. The structure was oriented on tangent with CTH "S". Each span was 185 feet long, and the overall length was 745'-6". The overall width was 20'-6", though modern guardrails inside the trusses narrowed the roadway to 19'-6". The vertical clearance was 15'0". The bottom chord consisted of four angles tied with V-lacing and widely spaced tie bars. The top chord and end post were composed of double channels connected with cover-plates on the top, and X-lacing on the bottom. The maximum distance between the bottom and top chords was 37'-2-2/5". The trusses had built-up structural members with riveted connections, and roller nest expansion bearings. Stringers were 12'-5-1/4" long I-beams spaced 15 feet apart. The floor beams were 24'-9" I-beams with 21-foot spacing. The deck was originally wood, but was replaced with concrete in the 1970s. The abutments and piers were concrete.[14]

The Lake Wissota Bridge was built by the Toledo Bridge and Crane Company under contract to the Wisconsin-Minnesota Light and Power Company. Although the proposal accepted by the county specified that plans were to be "prepared by the Company and approved by the State Highway Commission," it is not known what input the SHC had. They may have provided standard plans or specifications as a basis for preparing final plans, or they may only have reviewed the final plans submitted to them by WMLPC or the contractor.[15] In December 1916, M.W. Torkelson, State Bridge Engineer, did inspect the Lake Wissota Bridge and other bridges being constructed by WMLPC at that time.[16]

The Wisconsin Department of Transportation's Historic Bridge Advisory Committee (HBAC) selected four important and obvious features of truss bridges by which the chronological development of trusses in the state could be documented. Those features were: structural members and their connections, the location of the floor beams relative to the bottom chord, the live and dead load configurations and the type of expansion bearings. These features helped HBAC to systematically study the evolution of truss design and fabrication, the spread of technology from urban to rural areas, and the commitment of resources to modern roads. In Wisconsin, metal highway trusses seem to have been predominantly of the "light wagon" type from the 1870s to around 1910. These trusses featured structural members of built-up sections with pin-connections. The floor beams were hung

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[14] Wisconsin Department of Transportation, Bridge Section, Card File, Inspection Report File, and Computerized Inventory File; Robert S. Newbery, Field Review, March 9, 1982.

[15] Proceedings, May 1916, 28. By 1913, the SHC's set of standard plans included designs for bridges with span lengths of 180 feet. It had also designed the 200-foot long Hemlock Bridge, a Pennsylvania truss. Such span lengths were by this time, short by national standards; the preference in Wisconsin was for multiple span bridges, with shorter span lengths. See Robert S. Newbery, HAER Documentation for Hemlock Bridge, HAER No. WI-5, 1984.

[16] Chippewa Weekly Herald 8 December 1916: 2, col. 1.

from the bottom chord, often with very simple connections. These structures were designed to carry a load of only a few tons at a slow speed. The longer, overhead trusses of this period tended to have roller nest, rather than rocker, expansion bearings.[17]

The appearance of riveted trusses with rolled sections, floor beams located above the bottom chord, higher live load capacity, and rocker expansion bearings in the 1910s is a measure of the influence and drive for standardization and professionalism of the State Highway Commission, the emergence of major bridge building firms in Wisconsin cities, and the integration of Wisconsin's rural areas into a regional, if not national, marketplace.[18]

In 1982, there were 36 Parker overhead trusses extant in Wisconsin. These Parkers were divided into three subgroups: pin-connections with built-up members, riveted connections with built-up members, and riveted connections with rolled members.[19] Only one pin-connected Parker truss was found at that time. Built in 1908 by Hennepin Bridge Company of Minneapolis, Minnesota, this structure had an estimated live load capacity of five tons, and had roller nest expansion bearing. This bridge was replaced in 1983.[20] Seventeen Parker trusses were identified that had riveted connections and built-up members. The Lake Wissota Bridge is the oldest of these seventeen, and the only one with roller-nest expansion bearings.

Several features of the Lake Wissota Bridge, including connections, bearings, and design configuration, suggest advanced technology for its time. The live load capacity of the Lake Wissota Bridge was greater than that of a light wagon bridge, though it is not known if impact loading was computed when it was erected. The SHC began making such computations by the 1920s. However, the portal elevation indicated a massive upper web configuration suggestive of an earlier, less advanced design.[21]

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[17] See Robert S. Newbery and H. Guy Meyer, "Ordinary Iron Highway Bridges," Wisconsin Academy Review (March 1983): 34-37. A state law allowing any toll-free bridge in the state longer than 25 feet to be posted with a sign stating "One dollar fine for riding or driving on this bridge faster than a walk" was passed in 1849 and continued until at least 1878. Laws of Wisconsin, 1849, Title VI, Chapter 16, Sections 100 and 101 (Southport, 1849); Laws of Wisconsin, 1878, Chapter 52, Section 1323 and 1324 (Madison, 1878).

[18] Newbery and Meyer, "Highway Bridges" 34-35. Wisconsin cities most notable for their bridge building firms include: Milwaukee, Eau Claire, Wausau, and La Crosse.

[19] These criteria were developed by WisDOT's Historic Bridge Advisory Committee, which included representatives of WisDOT Department, the Federal Highway Administration, and the State Historic Preservation Office.

[20] This pin-connected Parker was known as the Radisson Bridge and was replaced with state funds in 1983. Therefore, a state-level historic report, including text and 35mm photographs, was prepared hy WisDOT and filed with the Wisconsin SHPO.

[21] F.C. Kunz, Design of Steel Bridges (New York, 1915) 172.

The erection of the Lake Wissota Bridge was not featured in the local newspapers. Instead they carried stories about clearing the brush from the future lake site, construction of the new dam, purchase and removal of the existing "Yellow River Bridge," and avoiding disruption of highway traffic during the whole project. The dam was seen as much as an economic boon to the area as a great engineering feat. Stories carried by the newspapers tended to focus on technological aspects of the dam; though a few progress reports, including discussions of weather delays and labor problems, also appeared. There was also one report of a rumor that foreign sympathizers would attempt to blow up the dam.[22]

The greatest concern, as identified by the newspapers, was whether the future lake site would be cleared of brush and trees before it was inundated. Local boosters dreamed of a lake that would not just be a "financial asset to the company which has erected the dam," but also be "a thing of beauty and a joy forever." Who would pay for the clearing of the brush and trees was a matter of great debate. WMLPC did not want to incur this expense, and suggested holding the water level of the new lake at 10 feet below the crest until it froze, at which time brush and trees could easily be cut off at a point well below the future surface. Promoters of the beautiful lake concept feared this would leave brush and snags to contaminate the lake causing it to turn green in summer. Fisheries might also suffer as a result of the debris. Ultimately, some cutting and clearing was done through the initiative of volunteers and the local government. Exactly how much was cleared, and what role, if any, WMLPC played, is not known.[23]

The old "Yellow River Bridge," built in 1908 and removed to make way for the lake, was a two-span Pennsylvania truss. This "light wagon bridge" had pin-connections and roller nest expansion bearings. It had a 15-7' roadway, and a seven-ton capacity. Purchased by the towns of Eagle Point and Arthur in 1916, it was moved to a new location a few miles to the north, where it became known as the Cobban Bridge.[24]

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[22] On the dam construction see, Chippewa Falls Evening Independent 15 November 1916; 19 November 1916: 3; 21 December 1916: 5; 5 January 1917; 14 January 1917: 4; 16 January 1917: 3; 6 February 1917: 5; 7 February 1917: 6, col. 5; 12 February 1917: 3, 6; 25 March 1917: 4; Chippewa Falls Weekly Herald 10 November 1916: 5, col. 1; 17 November 1916: 1, col. 5; 8 December 1916: 5, col. 3. On moving the old bridge, see Evening Independent 19 December 1916: 1; 22 December 1916: 1; Weekly Herald 22 December 1916: 1, col. 3; 1917: 26 January 1917: 1, col. 3. On the foreign sympathizers, see Evening Independent 12 February 1917: 6, col. 1.

[23] Evening Independent 17 January 1917: 3; 19 January 1917: 2; January 21, p. 7; 23 January 1917: 2, col 2; 26 January 1917: 2, col 2; 28 January 1917: 5, col. 1, 2; Weekly Herald 15 December 1916: 6; 22 December 1916: 1; see also, Proceedings, May 1916, 26.

[24] Proceedings, March 1907, 33; May 1908, 17, 18. See also Ibid, November 1907, 20-21; March 1909, 11; May 1909, 11, 16; November 1909, 15, 18, 25; November 1910, 17, 24. Chippewa Herald Telegram, December 11, 1982, 1, 3.

The Cobban Bridge remains in limited service at its relocated site. In recent years it bas aroused the interest of many local residents. In 1985, a state bistoric marker was erected.[25] In the summer of 1987, a team from the Historic American Engineering Record, National Park Service, documented the Cobban Bridge.[26] Traffic is currently restricted to pedestrians, and a feasibility study is being conducted to assess the future of this structure.

TOLEDO BRIDGE AND CRANE COMPANY

The Toledo Bridge and Crane Company, one of a bandful of bridge building companies operating out of Toledo at this time, was a sbort-lived spin-off from the Massilon Bridge Company. Toledo Bridge was incorporated in 1911 with a capital of $400,000. It ceased operation in the early 1920s after the death of company president, Charles A. Peckham.

Peckham worked for three different bridge companies before founding Toledo Bridge. In 1904, Peckham was secretary and treasurer of the F. Bissell Company, consulting engineers, and vice president of the Sbifley and Burdick Company, manufacturers of cornice iron, tin and copper work, and dealers in bardware. The following year Peckham became secretary and treasurer of the Toledo-Massilon Bridge Company, which shared offices with the Massilon Bridge company.[27]

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[25] WisDOT, Bridge Section Microfilm files, plans and contracts for Bridge No. B-09-0965; Herald Telegram, 11 December 1982: 1, 3; 22 March 1983: 1; 5 August 1985: A5. See also Chippewa Evening Independent 17 December 1916: 5; and Chippewa Weekly Herald 22 December 1916: 1, 6; 26 January 1917: 1.

[26] The HAER team was under contract to the Wisconsin Department of Transportation. The HAER number for the Cobban Bridge (Yellow River Bridge) is WI-28.

[27] Polk's Toledo City Directory. 1904, 1905, 1913, 1915, 1919, 1922 editions (Toledo, Ohio).

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Fig. 1 USGS Quad: Lake Wissota, Wisconsin (7.5 minute series)
south end: 15:4981435:630415
north end: 15:4981655:630435